

PROJECT PAPER

IRG AGRO AIR FREIGHT

Technology Platform & Intellectual Property

**A part of an IRG-ECO Agro FTR based Integrated Agro
Project (Agro SPV)**

OR

A standalone project in tie with Agro SPVs

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1. Executive Summary

1.1 Investment Highlights

Aspect	Description
Asset	Complete air freight operations platform backed by novel IRG-ECO Airfreight FTRs
Innovation	World-first tokenization of air freight capacity as tradeable transport right
Stage	Fully designed, specified, and prototyped; ready for production deployment
IP Status	Proprietary; registered IPR; patent-eligible business method
Market	India agricultural exports (\$50B+); air freight fastest-growing segment
Farmers Network	A million+ farmer-network potential supporting the project

1.2 Why This Opportunity Exists

Indian agricultural exports are constrained not by production capacity or market demand, but by structural inefficiencies in the logistics value chain. Farmers receive only 15-25% of the final retail price in destination markets, with the balance captured by layers of intermediaries.

The IRG Agro Air Freight platform solves this through three innovations: (1) the AF-FTR financial instrument that pre-funds operations, (2) a service-fee SPV model that eliminates trading margins, and (3) a last-mile associate network that bypasses wholesale distribution.

The result: farmers receive 55-65% of retail price — a 150-240% income increase.

2. The Opportunity

2.1 Problem Statement

The agricultural export supply chain is fundamentally broken:

Problem	Impact	Current Solutions	Why They Fail
Multiple intermediaries	50-70% value leakage	Cooperatives, FPOs	Become intermediaries themselves
Freight rate volatility	Unpredictable margins	Futures hedging	Not accessible to farmers
Cold chain breaks	15-30% spoilage	Better packaging	Doesn't address transit gaps
Fragmented production	No scale for direct export	Aggregators	Extract trading margins
Payment delays	60-90 day cycles	Trade finance	High cost, low access

2.2 The IRG Solution

IRG has designed a complete system that addresses each structural failure:

Problem	IRG Solution	Mechanism
Funding constraint	Farmers funding through hedged booking rights	Farmers buy IRG FTRs of the Airfreight project
Intermediaries	Direct farmer-to-consumer	Last-mile associate network, no bulk buyers
Freight volatility	AF-FTR rate locking	Pre-purchased transport rights at fixed rates
Cold chain	IoT monitoring + alternate routing	Real-time tracking, buffer inventory
Fragmentation	SPV aggregation	Service-fee model, farmers retain ownership
Payment delays	AF-FTR pre-funding	Operations funded by FTR sales, not receivables

2.3 What Makes This Different

Previous attempts at agricultural supply chain "disruption" have failed because the disruptor eventually becomes the new intermediary. IRG's design prevents this through three structural choices:

- 1. SPV Service Model:** The aggregation entity earns fixed service fees, not buy-sell spreads. It has no incentive to suppress farmer prices.
- 2. No Bulk Buyers:** The last-mile network sells directly to consumers. No single buyer controls more than 0.5% of volume, eliminating leverage.
- 3. Farmer Ownership:** Cargo title remains with the farmer until consumer payment. The farmer is the exporter of record, not a supplier to an exporter.

3. The AF-FTR Innovation

3.1 What is an AF-FTR?

The Air Freight Future Transport Right (AF-FTR) is a novel financial instrument that represents a pre-purchased right to ship cargo at a pre-fixed freight rate, exercisable anytime within a validity period.

Attribute	Description
Definition	Blockchain-registered right to ship cargo at pre-fixed freight rate, anytime in the future
Underlying Asset	Air freight capacity on specified routes
Denomination	Per kilogram of cargo capacity
Validity	Defined period (typically 3-12 months)

Transferability	Fully transferable to other registered users
Redemption	Converts to actual shipment booking when exercised
Settlement	Physical (cargo shipped) or cash (if not exercised)

3.2 Why AF-FTR is Novel

Existing freight derivatives and futures are designed for large institutional players and settle in cash. They do not provide small producers with actual transport capacity. The AF-FTR is different:

Feature	Freight Futures/Derivatives	AF-FTR
Target user	Institutions, traders	Farmers, SME exporters
Settlement	Cash only	Physical (cargo shipped)
Minimum size	Container/TEU	Per kilogram
Purpose	Speculation, hedging	Actual transport + hedging
Underlying	Index-based	Actual capacity
Transferability	Exchange-traded	P2P on platform
Funding effect	None	Pre-funds operations

3.3 The Circular Funding Model

The AF-FTR creates a self-sustaining funding cycle:

Step 1: Farmers sell Agro FTRs (locked produce prices) to buyers

Step 2: Agro FTR proceeds used to purchase AF-FTRs (locked freight rates)

Step 3: AF-FTR sales revenue funds aircraft leasing and operations

Step 4: Farmers ship produce using their AF-FTRs at pre-fixed rates

Step 5: Premium prices from direct-to-consumer sales flow back to farmers

Step 6: Cycle repeats with expanded capacity

This model eliminates the need for external working capital financing. The ecosystem self-funds through the FTR mechanism.

3.4 Regulatory Positioning

The AF-FTR has been structured to stay safe from regulatory classification as:

Not a Security: It is a prepaid service right, not an investment contract

Not a Derivative: Physical settlement, not cash settlement against an index

Not a Payment Instrument: Not redeemable for cash; converts only to transport service

Not a Cryptocurrency: Not a medium of exchange; represents specific physical capacity

This positioning has been validated through careful terminology choices throughout the platform design.

4. Technology Platform

4.1 System Overview

The IRG Agro Air Freight platform is a comprehensive operations management system comprising four integrated modules:

Module	Functions	Key Features
Operations Management	Flight scheduling, cargo booking, tracking, cold chain	9 sub-modules, real-time tracking, IoT integration
Cost Administration	Assumptions management, calculations, history	Editable parameters, audit trail, dynamic calculator
Market Intelligence	External data, daily reports, approvals	8 API integrations, admin workflow, alerts
Performance Reporting	Profitability, costs, load factor	Multi-period, custom ranges, export

5. Market Opportunity

5.1 Addressable Market

Market Segment	Size (Annual)	Growth Rate	IRG Focus
India Agricultural Exports	\$50+ billion	8-10% CAGR	Fresh produce segment
India Air Freight Exports	\$8 billion	12-15% CAGR	Perishables priority
Fresh Produce Air Freight	\$2.5 billion	18-20% CAGR	Primary target
Gulf + EU + APAC Markets	\$1.8 billion (from India)	15% CAGR	14 routes designed

5.2 Target Routes

The platform is designed for 14 routes across three hubs:

Hub	Destination	Distance	Key Commodities	Cost/kg
Panvel	Dubai	2,000 km	Grapes, pomegranates, mangoes	₹57.71

Panvel	Riyadh	2,800 km	Vegetables, fruits	₹61.24
Panvel	Kuwait	2,800 km	Fresh produce	₹56.99
Indore	London	7,100 km	Baby corn, fine vegetables	₹102.30
Indore	Frankfurt	6,500 km	Organic produce	₹98.14
Guwahati	Singapore	5,600 km	Exotic fruits, spices	₹90.61
Guwahati	Tokyo	4,750 km	Premium fruits	₹72.02

5.3 Competitive Landscape

Competitor Type	Examples	Limitation	IRG Advantage
Traditional Forwarders	DHL, FedEx, Kuehne+Nagel	B2B focus, no farmer access	Direct farmer enrollment
Agri Exporters	INI Farms, Desai Fruits	Trading model, not service	SPV service model
Logistics Tech	Freightos, Flexport	Rate comparison, not capacity	AF-FTR capacity ownership
Farm-to-Fork Startups	Ninjacart, DeHaat	Domestic focus	Export-first design

5.4 Farmer Network

A pre-identified network of 150,000 acres is available for enrollment:

Region	Acreage	Primary Crops	Export Readiness
Maharashtra (Nashik, Sangli)	45,000 acres	Grapes, pomegranates, onions	High (existing export culture)
Madhya Pradesh (Indore belt)	35,000 acres	Soybean, baby corn, vegetables	Medium-High
Karnataka (Bangalore rural)	25,000 acres	Flowers, fine vegetables	High
Gujarat (Kutch, Saurashtra)	20,000 acres	Dates, castor, groundnut	Medium
Northeast (Assam, Manipur)	25,000 acres	Exotic fruits, spices, tea	Medium (infrastructure building)

6. Business Model

6.1 Revenue Streams

Revenue Stream	Description	Pricing Model	% of Revenue
AF-FTR Sales	Pre-sale of freight rights	Cost + margin (locked rate)	35-45%
Spot Freight	Non-FTR bookings at market rate	Market rate	30-40%
SPV Service Fee	Aggregation and documentation	5% of cargo value	10-15%
Last-Mile Commission	Share of associate margin	2-3% of delivery value	5-8%
Platform Fees	Technology access, API calls	Subscription + usage	3-5%
Ancillary	Insurance, packaging, cold chain	Pass-through + margin	5-8%

6.2 Capacity Allocation Strategy

The 25-35% AF-FTR cap is a deliberate capital discipline mechanism:

Capacity Allocation	Percentage	Purpose	Risk Profile
AF-FTR Pre-Fixed	25-35%	Fund fixed costs, guarantee farmer rates	Low (pre-sold)
Spot Market	40-50%	Capture market upside, flexibility	Medium (market rate)
Buffer/Local	20-25%	Absorb demand fluctuations, alternate outlets	Low (safety valve)

6.3 Unit Economics

6.3.1 Per-Kilogram Economics (Dubai Route)

Component	Traditional Model	IRG Model	Difference
Farm gate price	₹30	₹30	—
Middleman margin	₹15 (50%)	₹0	-₹15
Freight cost	₹75-90	₹57.71	-₹20-32
Handling/cold chain	₹10	₹8	-₹2
Total cost to Dubai	₹130-145	₹95.71	-₹35-49
Dubai retail price	₹180	₹180	—
Farmer net realization	₹35-50	₹84.29	+₹34-49

Farmer income increase: 70-140%

6.3.2 Per-Flight Economics

Metric	Value	Notes
Payload capacity	105,000 kg	B747-400F
Average load factor	87%	Target
Revenue per flight (AF-FTR)	₹60-65 lakhs	At ₹57-62/kg
Direct costs per flight	₹48-52 lakhs	Fuel, airport, handling
Contribution margin	₹10-15 lakhs	Before allocation of fixed costs
Annual flights per route	25-30	Based on demand
Break-even load factor	72%	Covers all costs

7. Competitive Advantages

7.1 Structural Moats

Moat	Description	Defensibility
AF-FTR Instrument	Novel financial product; patent-eligible	High (IP protection)
Farmer Network	150,000 acres potential	Very High
SPV Model	Service fee eliminates conflict of interest	High (structural design)
No Bulk Buyers	Last-mile network prevents concentration	High (market structure)
Regulatory Navigation	Careful positioning avoids securities law	Medium-High (first-mover)
Integrated Intelligence	Real-time costs, admin approval workflow	Medium (can be replicated)

7.2 Why This Cannot Be Easily Replicated

- 1. The Farmer Network:** Building trust with farmers requires years of relationship development. This cannot be acquired with capital alone.
- 2. The AF-FTR Concept:** The financial instrument design, regulatory positioning, and circular funding model represent significant intellectual innovation that took years to develop.
- 3. The SPV Structure:** The service-fee model requires deliberate choice to forgo trading profits. Most entrants default to trading because margins are higher short-term.
- 4. The Last-Mile Network:** Building an associate network in Dubai, London, and Singapore requires local presence, regulatory compliance, and consumer brand building.

7.3 Expansion Potential

The platform design supports expansion across multiple dimensions:

Expansion Vector	Opportunity	Adaptation Required
New origin countries	Kenya (flowers), Vietnam (seafood), Peru (asparagus)	Local SPV setup, hub infrastructure
New commodities	Seafood, pharmaceuticals, flowers	Cold chain specs, regulatory compliance
New destinations	Middle East expansion, North America	Route configuration, LMA recruitment
Adjacent services	Agri-insurance, trade finance, input supply	Partner integrations

8. Financial Projections

8.1 Five-Year Projections

Metric	Year 1	Year 2	Year 3	Year 4	Year 5
Farms Enrolled (acres)	15,000	45,000	90,000	130,000	150,000
Annual Cargo (MT)	5,000	18,000	40,000	65,000	85,000
Active Routes	4	8	12	14	16
Gross Revenue (₹ Cr)	15	55	130	220	300
Operating Costs (₹ Cr)	13	45	100	165	220
EBITDA (₹ Cr)	2	10	30	55	80
EBITDA Margin	13%	18%	23%	25%	27%
LMAs Deployed	50	180	400	550	650
Flights (Annual)	50	180	400	650	850

8.2 Key Assumptions

Cargo Yield: Average ₹28-32/kg blended across AF-FTR and spot

Load Factor: 85-90% average (conservative for perishables)

Fuel Cost: 50-55% of direct costs (based on current analysis)

LMA Productivity: 100-150 kg/day/LMA average

Seasonality: 60% of volume in Sep-Mar (peak export season)

8.3 Capital Requirements

Use of Funds	Year 1	Year 2	Total
Technology Development	₹3 Cr	₹2 Cr	₹5 Cr
Hub Infrastructure	₹5 Cr	₹8 Cr	₹13 Cr
Aircraft Lease Deposits	₹8 Cr	₹12 Cr	₹20 Cr
LMA Network Setup	₹2 Cr	₹4 Cr	₹6 Cr
Working Capital	₹4 Cr	₹6 Cr	₹10 Cr
Marketing & Farmer Enrollment	₹2 Cr	₹3 Cr	₹5 Cr
TOTAL	₹24 Cr	₹35 Cr	₹59 Cr

Note: The AF-FTR pre-sale model significantly reduces external capital requirements by using FTR sales proceeds to fund lease deposits and operations.

9. Valuation

9.1 Valuation Methodology

The valuation considers multiple approaches:

Method	Approach	Value Range
Replacement Cost	Development effort + documentation + IP	\$1.0M – \$1.5M
Comparable Transactions	Similar IP/platform deals	\$3M – \$8M
Strategic Value	Value to specific acquirer types	\$10M – \$25M
DCF (Operating Business)	Projected cash flows if operationalized	\$20M – \$55M

9.2 Component Valuation

Component	Description	Value (USD)
Software Platform	Code, documentation, specs	\$0.9M – \$1.2M
AF-FTR IP	Financial instrument design, patents	\$2M – \$5M
System Architecture	Microservices design, integrations	\$0.5M – \$1M
Transaction Taxonomy	94 transaction types, state machines	\$0.3M – \$0.5M
Business Model IP	SPV structure, LMA model, circular funding	\$1M – \$3M
Documentation	Dev bible, specs, regulatory positioning	\$0.3M – \$0.8M

TOTAL (IP + Technology)		\$5M – \$11.5M
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9.3 Strategic Premium by Acquirer Type

Acquirer Type	Strategic Interest	Premium	Total Value
Global Logistics	Enter agri-freight, farmer-direct	1.5-2x	\$12M – \$20M
Agri-Tech Platform	Disintermediate supply chain	2-3x	\$15M – \$25M
Airline/Cargo	Differentiated product	1.2-1.5x	\$8M – \$15M
Fintech	Novel financial instrument	1.3-1.8x	\$8M – \$15M
Private Equity	Platform for rollup	1.5-2x	\$10M – \$20M

9.4 Recommended Valuation Range

Scenario	Value (USD)	Value (INR)	Includes
Floor (Tech Only)	\$5 million	₹42 Crore	Software, docs, basic IP
Base (Tech + IP)	\$10 million	₹84 Crore	Above + AF-FTR patents, business model
Strategic (Full Rights)	\$15 million	₹126 Crore	Above + exclusivity, transition support
Premium (With Network)	\$20+ million	₹168+ Crore	Above + farmer network access

10. Transaction Structure

10.1 Alternative: Strategic Licensing

Element	Terms
Royalty	5% of gross revenue from licensed operations
Term	10 years with renewal option
Sublicensing	Permitted with approval
Technology Updates	Included for term of license
Territory Options	Gulf, EU, APAC available separately

11. Risk Factors

11.1 Operational Risks

Risk	Description	Mitigation	Residual Risk
Demand-supply mismatch	Seasonal production vs. capacity	Multi-outlet cascade (export → local → processing)	Low
Cold chain failure	Temperature excursions in transit	IoT monitoring, alternate routing, buffer inventory	Low-Medium
Aircraft availability	Lease market tightness	Long-term lease agreements, multiple lessors	Medium
Hub infrastructure	Airport capacity constraints	Multiple hub strategy, off-peak slots	Low

11.2 Financial Risks

Risk	Description	Mitigation	Residual Risk
Forex volatility	INR depreciation increases costs	60% hedging policy, USD pricing where possible	Medium
Fuel price spikes	Jet fuel is 50%+ of costs	Fuel surcharge mechanism in AF-FTR terms	Medium
AF-FTR undersubscription	Pre-sales below target	Conservative 25-35% allocation, spot flexibility	Low
Payment defaults	Buyer/LMA defaults	Advance payment model, escrow mechanism	Low

11.3 Regulatory Risks

Risk	Description	Mitigation	Residual Risk
AF-FTR classification	Regulator views as security	Careful terminology, legal opinions obtained	Low-Medium
Export restrictions	Government bans on commodities	Diversified commodity mix, quick pivot capability	Medium
Aviation regulations	Charter/cargo license requirements	Partner with licensed operators	Low
Destination country rules	Import restrictions	Pre-clearance protocols, multiple destinations	Low

11.4 Competitive Risks

Risk	Description	Mitigation	Residual Risk
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Incumbent response	Traditional forwarders cut prices	Farmer loyalty through SPV model, better economics	Medium
Tech replication	Competitors copy platform	IP protection, farmer network moat	Low-Medium
New entrants	Well-funded startups enter	First-mover advantage, network effects	Medium
Disintermediation of IRG	Farmers bypass platform	Value-add services, rate guarantees	Low

12. Appendices

12.1 Documents Available

Document	Pages	Description
System Development Bible	50+	Complete technical specifications for development
Transaction Taxonomy	30+	94 transaction types with state machines
Cost Analysis Workbook	15 sheets	Route economics, assumptions, formulas
UI/UX Prototypes	4 HTML files	Working prototypes of all modules
Route Database	14 routes	Distances, costs, aircraft assignments
Regulatory Positioning Memo	10	Legal analysis of AF-FTR classification
Farmer Network Potential	Summary	150,000 acres across 5 regions

12.2 Route Summary

Route	Distance	Aircraft	Net Cost/kg	Return Credit
Panvel → Dubai	2,000 km	B747-400F	₹57.71	15%
Panvel → Riyadh	2,800 km	B747-400F	₹61.24	10%
Panvel → Kuwait	2,800 km	B747-400F	₹56.99	12%
Indore → London	7,100 km	B747-400ERF	₹102.30	25%
Indore → Frankfurt	6,500 km	B747-400ERF	₹98.14	20%
Guwahati → Singapore	5,600 km	B747-400F	₹90.61	18%
Guwahati → Tokyo	4,750 km	B747-400F	₹72.02	15%

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